

CLAIMS

1. An illumination device for simulating neon lighting, comprising:

a substantially rod-like member having a predetermined length with a light-receiving surface and a light-emitting surface, said rod-like member being composed of a substantially flexible compound; and

an elongated and substantially flexible light source extending along and positioned adjacent the light-receiving surface of said rod-like member, such that light entering the rod-like member from the elongated light source and through the light-receiving surface is preferentially scattered, thus causing a light intensity pattern that appears substantially uniform along the light-emitting surface of said rod-like member.

2. The illumination device as recited in claim 1, in which said substantially flexible compound is impregnated with a filler, said filler deflecting light incident thereon so as to achieve the desired preferential scattering of light and causing the light intensity pattern to appear substantially uniform along the light-emitting surface of said rod-like member.

3. The illumination device as recited in claim 1, wherein the flexible compound is selected from the group consisting of polyurethane, silicone, and silicone rubber.

4. The illumination device as recited in claim 2, wherein the flexible compound is selected from the group consisting of polyurethane, silicone, and silicone rubber.

5. The illumination device as recited in claim 2, wherein said filler is a plurality of micro balloons.

6. The illumination device as recited in claim 4, wherein said filler is a plurality of micro balloons.

7. The illumination device as recited in claim 1, and further comprising a housing for enclosing said light source, said housing being positioned below and extending along said rod-like member such that the light source emits light into the light-receiving surface of the rod-like member.

8. The illumination device as recited in claim 7, wherein said housing includes a pair of side walls defining an open-ended channel that extends substantially the predetermined length of the rod-like member.

9. The illumination device as recited in claim 8, wherein said housing further includes a floor portion, connecting said side walls so that the housing has a substantially U-shape.

10. The illumination device as recited in claim 7, wherein internal surfaces of said housing are provided with a light-reflecting material in order to increase light collection efficiency by reflecting light incident upon the internal surfaces of said housing into the light-receiving surface of said rod-like member.

11. The illumination device as recited in claim 8, and further comprising a flexible circuit board received in the open-ended channel defined by the side walls of said housing.

5 12. The illumination device as recited in claim 11, wherein the position of said light source and the flexible circuit board within the open-ended channel are maintained by filling the open-ended channel with a flexible potting material.

10 13. The illumination device as recited in claim 1, wherein said elongated light source is a multiplicity of spaced point light sources arranged in a line extending substantially along the light-receiving surface of said rod-like member.

14. The illumination device as recited in claim 13, wherein said point light sources are light emitting diodes.

15 15. The illumination device as recited in claim 1, wherein said rod-like member defines an internal channel extending substantially along its predetermined length, the elongated light source being housed within this channel so as to emit light into the light-receiving surface of said rod-like member.

20 16. The illumination device as recited in claim 15, and further comprising a flexible circuit board received in the internal channel defined by said rod-like member.

17. The illumination device as recited in claim 16, wherein the position of said light source and the flexible circuit board within the internal channel are maintained by filling the internal channel defined by said rod-like member with a flexible potting material .

5 18. The illumination device as recited in claim 15, and further comprising a collection surface adjacent a portion of the outer surface of the rod-like member and near said light source for collecting and reflecting light not emitted directly into said rod-like member.

19. A method of making an illumination device capable of simulating neon lighting,
10 comprising the steps of:

impregnating a substantially flexible compound with a predetermined quantity of filler;

forming an essentially solid rod with a predetermined length from said flexible compound impregnated with filler;

15 positioning and securing an elongated light source substantially adjacent a light-receiving surface of said rod, such that light entering the rod from the elongated light source and through the light-receiving surface is preferentially scattered, thus causing a light intensity pattern that appears substantially uniform along a light-emitting surface of said rod; and
bending said rod into a desired shape.

20 20. The method as recited in claim 19, and further comprising the step of:

placing a housing having a pair of spaced walls defining a volume adjacent said light-receiving surface, said elongated light source being received and retained in said housing.

21. The method as recited in claim 20, and further comprising the step of:

5 essentially filling the volume defined by the spaced walls of the housing with a potting material.

22. The method as recited in claim 19, wherein said elongated light source is a multiplicity of spaced point light sources arranged in a line extending substantially along the
10 light-receiving surface of said rod.

23. The method as recited in claim 22, wherein said point light sources are light emitting diodes.

15 24. The method as recited in claim 20, wherein said side walls have interior surfaces that are light reflecting.